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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/788,857

02/26/2004

Chao I. Wu

MXICP031

6831

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7590

03/23/2005

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EXAMINER

NGUYEN, NAM THANH

ART UNIT

PAPER NUMBER

2824

DATE MAILED: 03/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/788,857

Applicant(s)

WU, CHAO I.

Examiner

Nam T. Nguyen

Art Unit

2824

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,9-11,13,19,20,22,28 and 29 is/are rejected.
- 7) ☒ Claim(s) 2,4-8,12,14-18 and 23-27 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: EAST search history.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 3, 9-11, 13, 19-20, 22 and 28-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Kuo et al.(US 2004/0017693).

Regarding claims 1, 10 and 29, Kuo et al. disclose the method of operating a memory cell comprising the steps of programming the memory cell (10 in fig. 2 and 3) from each of a right side (when 10 V is applied to conductor 28, 9V is applied to the drain 16 and the source is grounded, then a right bit 22a is written i.e. programmed; as shown in figure 2 and paragraph 0018) and a left side (when 10V is applied to the conductor 28, 9V is applied to the source, and the drain is grounded, then the left bit 22b is written to the cell i.e. programmed; see figure 3 and paragraph 0019 for more details), the right side (see explanation above) capable of storing a right bit and the left side (see explanation above) capable of storing a left bit, a quantity of charge used in the programming of the memory cell setting when interaction the right bit and the left bit is to exist; and reading (see fig.4) a charge level of the memory cell (when 3V is applied to the conductor 28, 2V is applied to the drain 16, and the source 14 is grounded, then

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the right bit 22a is processed to the cell i.e. reading; see figure 4 and paragraph 0022 for more details10) from a single side (since the source and the drain are not exchanged as stated in paragraph 0027, therefore the only one side is performed for reading).

Regarding claims 3, 13 and 22, Kuo et al. disclose the method of reading enables identification of the charge level ( see explanation in claim 2) when a read voltage is applied to a diffusion terminal (16) of the single side of the memory cell (70) and a ground voltage ( the source 14 is grounded) is applied to a diffusion terminal of the opposite side of the single side (see fig.4 and paragraph 0022 for more details).

Regarding claims 9, 19 and 28, Kuo et al. disclose the memory cell is a NROM (see paragraph 005).

Regarding claims 11 and 20, the notation 22a (figure 4) would be a first side that positioned in the right side and stores a first bit, and the notation 22b would be second side that positioned in the left side (as shown in figure 4) and stores a second left bit.

### ***Allowable Subject Matter***

3. Claims 2,4,5-8,12,14-18,21 and 23-27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance:

There is no teaching or suggestion in the prior art to:

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" reading the charge level from the single side limits reading from one side of the memory cell to enable identification of the charge level" as claimed in the dependent claims 2, 12 and 21. or

" the read voltage is maintained below 2 volts" as claimed in the dependent claims 4, 14 and 23. or

" the interaction between the right bit and the left bit exists when a higher charge is stored in the memory cell relative to lower charges that do not cause interaction between the right bit and the left bit" as claimed in the dependent claims 5, 15 and 24. or

" increased programmed charge in the left bit causes the interaction between the right bit and the left bit, such that the right bit is induced to increase in correlation with increases in the programmed charge in the left bit" as claimed in the dependent claims 7,17 and 26. or

" higher threshold voltages of the memory cell can be achieved when the interaction between the sight bit and the left bit of the memory cell exists relative to lower threshold voltages of the memory cell when no interaction between the right bit and the left bit of the memory cell exists" as claimed in the dependent claims 8, 18 and 27.

### ***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Maayan et al. (US 2003/0117861) or Avni et al. (US 2004/0222437) disclose NROM array similar to that of the present application, but fail to disclose as described above.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nam T. Nguyen whose telephone number is (571) 272-1878. The examiner can normally be reached on 8 am to 5:30.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on (571)272-1869. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nam T Nguyen  
Examiner  
Art Unit 2824

3/15/05

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**VANTHU NGUYEN**  
**PRIMARY EXAMINER**